National Institute of Environmental Health Sciences

Association between climate variability and hospital visits for non-cholera diarrhoea in Bangladesh: Effects and vulnerable groups

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Abstract:

BACKGROUND: We estimated the effects of rainfall and temperature on the number of non-cholera diarrhoea cases and identified population factors potentially affecting vulnerability to the effect of the climate factors in Dhaka, Bangladesh. METHODS: Weekly rainfall, temperature and number of hospital visits for non-cholera diarrhoea were analysed by time-series regression. A Poisson regression model was used to model the relationships controlling for seasonally varying factors other than the weather variables. Modifications of weather effects were investigated by fitting the models separately to incidence series according to their characteristics (sex, age, socio-economic, hygiene and sanitation status). RESULTS: The number of non-cholera diarrhoea cases per week increased by 5.1% (95% CI: 3.3-6.8) for every 10 mm increase above the threshold of 52 mm of average rainfall over lags 0-8 weeks. The number of cases also increased by 3.9% (95% CI: 0.6-7.2) for every 10 mm decrease below the same threshold of rainfall. Ambient temperature was also positively associated with the number of non-cholera diarrhoea cases. There was no evidence for the modification of both 'high and low rainfall' effects by individual characteristics, while the effect of temperature was higher amongst those individuals at a lower educational attainment and unsanitary toilet users. CONCLUSIONS: The number of non-cholera diarrhoea cases increased both above and below a threshold level with high and low rainfall in the preceding weeks. The number of cases also increased with higher temperature, particularly in those individuals at a lower socio-economic and sanitation status.

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Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Precipitation, Temperature

Geographic Feature: ☑

resource focuses on specific type of geography

Freshwater

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Bangladesh

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Other Diarrheal Disease

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content